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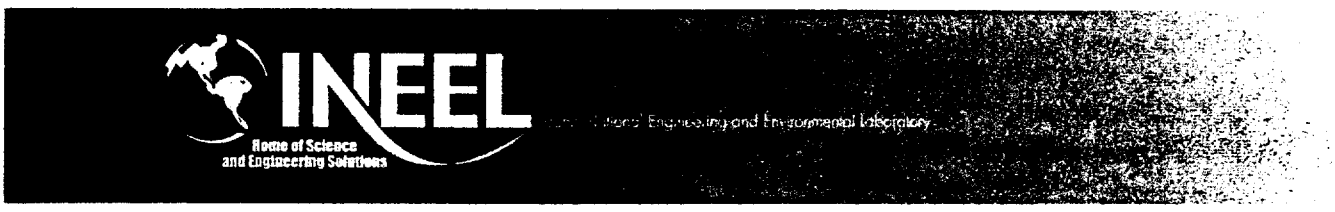
FY-04 Annual Operations Report for INTEC Operable Unit 3-13, Group 1, Tank Farm Interim Action



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December 2004

Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

ABSTRACT

This Annual Operations Report describes the activities and procedures conducted to inspect, monitor, and maintain the items installed during performance of the Waste Area Group 3, Operable Unit 3-13, Group 1, Tank Farm Interim Action, at the Idaho Nuclear Technology and Engineering Center.

This report describes inspection and monitoring activities for the surface sealing on specified tank farm areas, concrete-lined ditches and culverts in and around the tank farm, a lift station, and the lined evaporation pond. These activities are intended to assure that the interim action is functioning adequately to meet the objectives stated in the Operable Unit 3-13, Record of Decision for the Group 1, Tank Farm Interim Action (DOE/ID-10660) and as amended by the Agreement to Resolve Dispute, which was issued in March 2003.

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ACRONYMS

DEQ	Idaho Department of Environmental Quality
DOE	Department of Energy
DOE-Idaho	Department of Energy Idaho Operations Office
EPA	Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
FY	fiscal year
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
O&M	operation and maintenance
OU	operable unit
RA	remedial action
RadCon	Radiological Control
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
TFIA	Tank Farm Interim Action
WAG	waste area group

FY-04 Annual Operations Report for INTEC Operable Unit 3-13, Group 1, Tank Farm Interim Action, Phases 1 and 2

1. INTRODUCTION

The *Operation and Maintenance Plan for INTEC Operable Unit 3-13, Group 1, Tank Farm Interim Action, Phases I and II* (DOE-ID 2003) contains an annual reporting requirement. The annual report for the Tank Farm Interim Action (TFIA) provides a summary of the required monitoring data and maintenance activities. Below is a listing of the Operations and Maintenance (O&M) Plan items suggested for inclusion in the annual report along with a description of the actions taken in response to these recommendations:

1. A summary of the inspections performed – Section 3, Requirements for Inspections, Radiological Surveys, and Maintenance, contains details of the components inspected the inspection requirements and the inspection frequency.

2. A summary of sediment sampling and analysis results as required – No sediment was removed from the evaporation pond, so no sediment sampling and analysis was performed.

3. A summary of maintenance activities performed– Descriptions of maintenance items identified during inspections are reproduced and discussed in Section 4, Summary of FY-04 Inspections, Monitoring, Surveys, and Maintenance.

4. A summary of the evaporation pond monitoring data - The summary data are presented in Section 4.5, Evaporation Pond Leak Detection System.

5. An estimate of maintenance activities required for the next year – This information is listed in Section 5, An Estimate of Maintenance Activities Required for the Next Year.

6. A copy of completed inspection forms – The completed inspection forms, with all their attachments, are maintained in the project files and available upon request. Observations from the monthly inspections are summarized in this document.

7. Copies of available photographs of pertinent items, such as significant repairs performed during the year – Photographs have been included to illustrate noted maintenance items.

Inspections and annual reporting will continue for this interim action until the final remedy for Operable Unit (OU) 3-14 tank farm soil and groundwater is completed. Once the OU 3-14 Record of Decision (ROD) is signed further direction will be provided.

2. BACKGROUND

The Idaho Nuclear Technology and Engineering Center (INTEC), formerly known as the Idaho Chemical Processing Plant, is located in the south-central area of the Idaho National Engineering and Environmental Laboratory (INEEL) in southeastern Idaho (see Figure 2-1). From 1952 to 1992, operations at INTEC primarily involved reprocessing spent nuclear fuel from defense projects, which entailed extracting reusable uranium from the spent fuels. Liquid waste generated from the reprocessing activities, which ceased in 1992, is stored in an underground tank farm at INTEC. Both soil and groundwater contamination resulted from these previous operations. Under the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991), the Environmental Protection Agency (EPA), Idaho Department of Environmental Quality (DEQ), and Department of Energy (DOE) are directing cleanup activities to reduce human health and environmental risks to acceptable levels.

Several phases of investigation have been performed at the OUs within Waste Area Group (WAG) 3. A comprehensive remedial investigation/feasibility study (RI/FS) (DOE-ID 1997a, 1997b, 1998) was conducted for OU 3-13 to determine the nature and extent of contamination and corresponding potential risks to human health and the environment under various exposure pathways and scenarios. Based on the RI/FS results, INTEC release sites were further segregated into seven groups by contaminants of concern, accessibility, or geographic proximity to allow development and analysis of remedial action (RA) alternatives. The TFIA was designated as Group 1 within OU 3-13. The principal threats posed by the Group 1 soils are from direct radiation exposure to workers or the public and from potential leaching and transport of soil contaminants to perched water or the Snake River Plain Aquifer.

To meet the intent of the TFIA in the OU 3-13 ROD as altered in the Agreement to Resolve Dispute (DOE 2003), the following interim action activities have been completed for the Group 1 soils:

- Concrete-lined storm water collection ditches were installed around the tank farm.
- Selected culverts around the tank farm and out to the discharge point have been replaced with larger culverts to accommodate the expected increase in storm water flow.
- A lift station has been constructed at the intersection of Beech Street and Olive Avenue (CPP-1792) to pump storm water to a location where it will drain freely to the discharge point.
- Concrete headwalls and endwalls have been constructed as necessary throughout the lined drainage system.
- A double-lined evaporation pond with a leak detection system has been constructed to collect storm water run-off from the tank farm and other INTEC areas. The pond is located outside the INTEC security fence and north of Building CPP-698.
- A fence has been constructed around the evaporation pond.
- At the end of fiscal year 2004 (FY-04), site areas located inside the tank farm (CPP-28, -31, and -79) (see Figure 2-2) were covered with a surface-sealed asphalt infiltration barrier, and a surface water drainage system was installed to drain runoff toward the storm water collection system. Final construction activities were in progress during the final FY-04 inspection. Therefore, these components were not inspected nor included in this annual report.
- Asphalt coverings have been installed over selected areas in the 150-ft control zone around the tank farm (Figure 2-2).

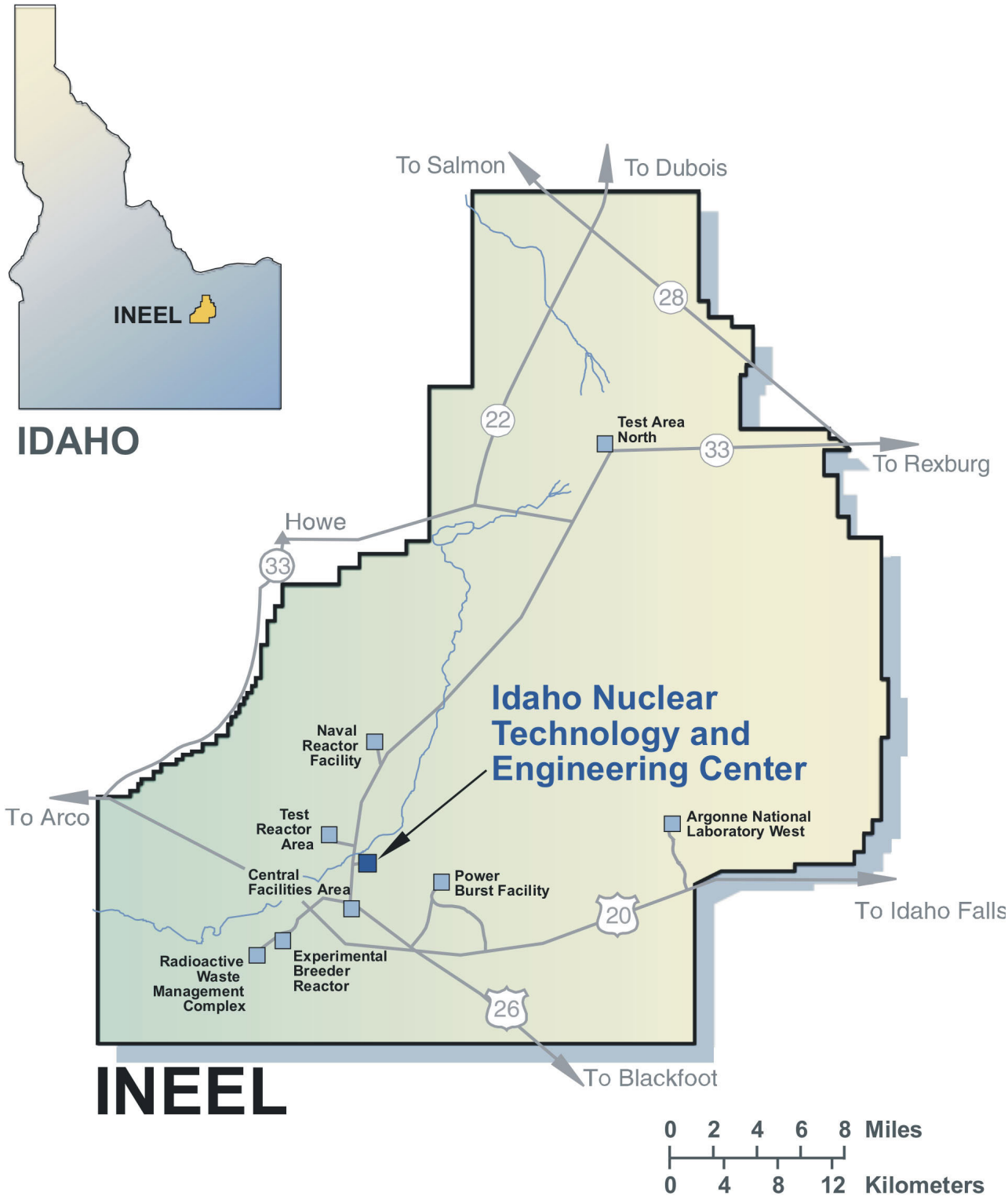

Figure 2-1. Location of INTEC at the INEEL.

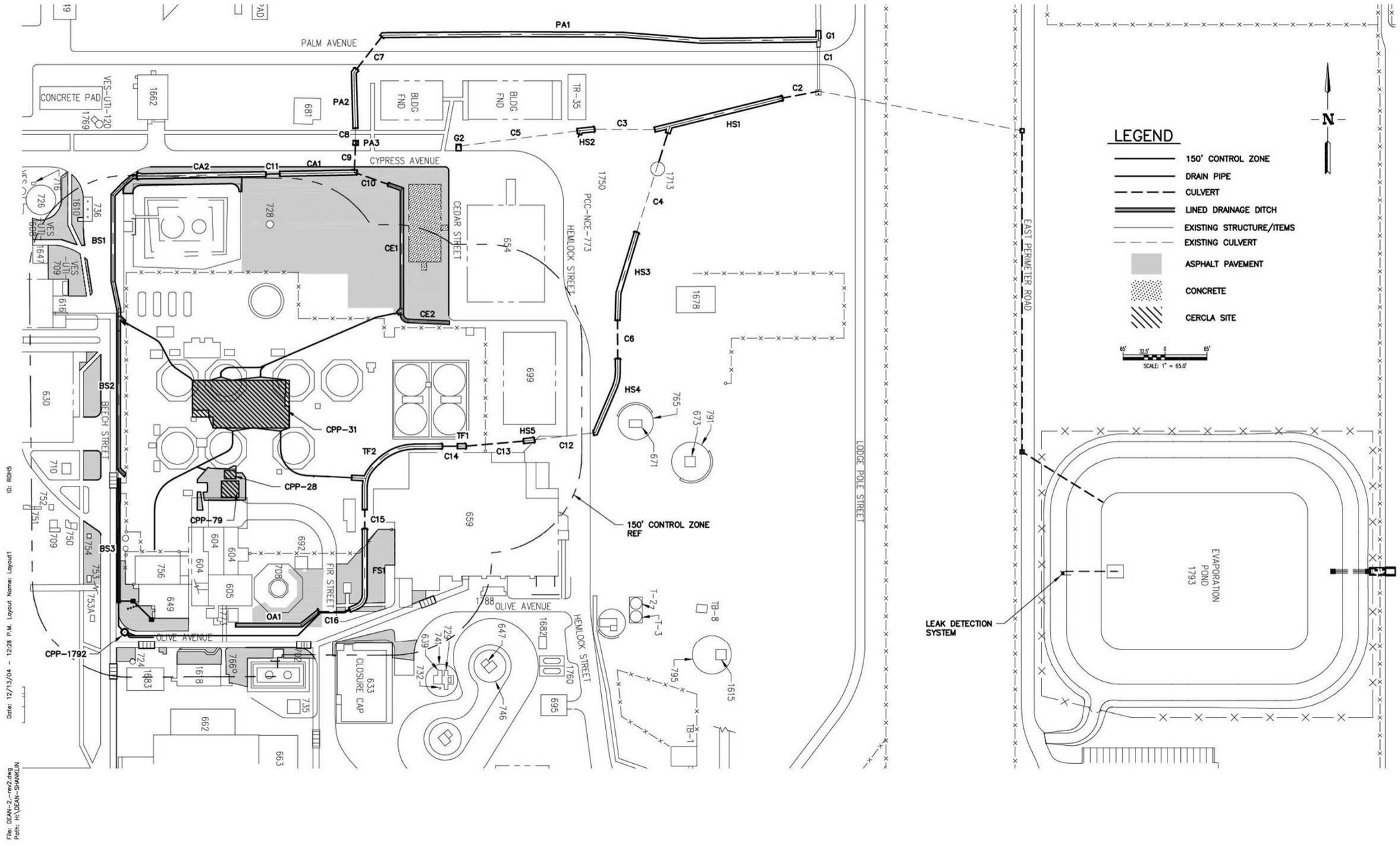

Figure 2-2. TFIA components.

3. REQUIREMENTS FOR INSPECTIONS, RADIOLOGICAL SURVEYS, AND MAINTENANCE

Requirements for visual inspections, radiological surveys, and maintenance were obtained from Revision 1 of the O&M Plan and INTEC Radiological Control (RadCon) requirements. In addition, comments received from the agencies increased the frequency of inspections for all components. Table 3-1 lists each TFIA component, inspection and survey requirements, and the frequency performed during the FY.

Reported items that required maintenance were addressed as per the requirements stated in the O&M Plan. Items located outside the tank farm were to be repaired as part of a coordinated effort with INTEC facility maintenance activities and as per the specification as provided in the vendor data for the equipment. Items located within the tank farm were to be repaired expeditiously to include performing temporary repairs until final repairs can be performed to route surface water runoff to the storm water collection system.

Table 3-1. Inspections, monitoring, radiological surveys, and maintenance requirements for the TFIA.

Component	Requirement	Frequency
Surface-sealed areas	Inspect to ensure integrity, monitor radiological conditions, and verify drainage to the storm water collection system.	Monthly and following installation and maintenance activities.
Storm water collection system	Inspect to ensure integrity of the system, to ensure drainage from the tank farm and other INTEC areas to the evaporation pond, and to monitor for radiological conditions.	Monthly and following installation and maintenance activities. Monthly radiological surveys.
Lift station	Inspect pumps and controls to ensure proper equipment operation.	Monthly and following installation and maintenance activities.
Evaporation pond liner and perimeter	Inspect the evaporation pond liner and associated area to ensure that the liner is not leaking and that the pond is performing as designed.	Monthly and following installation and maintenance activities.
Evaporation pond leak detection system	Inspect the leak detection system to ensure it is functioning properly.	Monthly and following installation and maintenance activities.
Sediment inspections and removal	Inspect the pond inlet and outlet for sediment debris accumulation to ensure that flow is not impeded.	Monthly and following installation and maintenance activities.

4. SUMMARY OF FY-04 INSPECTIONS, MONITORING, SURVEYS, AND MAINTENANCE

Inspections of the TFIA components were performed monthly during FY-04 on the dates shown in Table 4-1. Radiological surveys and utility inspections were performed during the month (except where stated below in Table 4-1) and incorporated in each monthly inspection report. The components that were installed and inspected during this FY included control zone asphalt-paved areas; the storm water collection system (concrete-lined drainage ditches, culverts, and the lift station); and the evaporation pond. The inspections performed were scheduled inspections. No repair or upgrade work was required; thus, no follow-up inspections were required. In addition, no contingency inspections were ordered by the Department of Energy Idaho Operations Office (DOE-Idaho)[a] when it has information that indicates the site integrity has been or may be threatened.

TFIA components were also monitored for radiological conditions in accordance with INEEL radiological monitoring and control policies which incorporate the requirements of 10 CFR 835.401 and 10 CFR 835.1102. This monitoring was specified based on input by INEEL RadCon personnel who are required to monitor areas at INTEC to (a) document radiological conditions, (b) detect changes in radiological conditions, including the gradual buildup of radioactive material, (c) verify the effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure, (d) maintain appropriate controls and restrictions to prevent the inadvertent transfer of contamination to locations outside of radiological areas, and (e) identify and control potential sources of individual exposure to radiation and/or radioactive material.

Table 4-1. FY-04 inspection dates.

Year	Month and Day	Radiological Surveys Completed During the Month
2003	October 27	Yes
	November 24	Yes
	December 22	No[a]
2004	January 28	No[a]
	February 24	No[a]
	March 23	Yes
	April 27	Yes
	May 25	Yes
	June 28	Yes
	July 19	Yes
	August 24	Yes
	September 22	Yes

a. Surveys were not conducted when snow covered the TFIA components.

a. Contingency inspections are unscheduled, situation-unique inspections, ordered by the DOE-Idaho when it has information that indicates the site integrity has been or may be threatened. Events that might trigger contingency inspections include severe rainstorms, floods, or highly unusual events such as tornadoes and earthquakes.

4.1 Surface-Sealed Areas

The selected asphalted areas within the 150-ft control zone (Figure 2-2) were inspected as part of the lined drainage ditch and culvert inspection. Inspections entailed a walkdown to evaluate the integrity of the areas looking for potential defects, damage, or deficiencies. Table 4-2 lists the items noted.

RadCon management has identified that these areas are deemed to be equivalent to all other paved areas within INTEC (outside the tank farm perimeter) and did not require a periodic radiological survey.

4.2 Storm Water Collection System

The storm water collection system consists of all TFIA concrete-lined ditches and culverts as identified in Figure 2-2. Labels were created for each individual lined ditch and culvert for use in describing component within the system that that has an identified maintenance item on the inspection form. The system was inspected monthly during FY-04. The inspections entailed walking entirely around and visually inspecting these areas (see Figure 2-2) to ensure that (a) the ditches, culverts, and discharge areas were free of sediment and debris that could prohibit run-off to the evaporation pond and (b) the integrity of the concrete was not compromised by fully penetrating cracks.

Radiological surveys were conducted each month to monitor for radiological conditions except when snow covered the lined ditched. In addition, the radiological surveys were not performed when wet conditions preclude performing an effective radiological survey. Noted items are included in Table 4-3.

The lined ditches were periodically cleared of debris during the year (see Table 4-3); however, no repair and upgrade activities were performed nor were necessary on any part of the storm water collection system. Two minor radiological items were reported during the year; their descriptions and actions taken are listed in Table 4-4.

Table 4-2. Summary control zone asphalt-paved areas inspections.

Date	Item	Comments and Action Taken
8/24/04	Asphalt near lined ditch CE1 (north of tank farm) damaged by track-mounted vehicle (see Figures A-1, A-3 in Appendix A).	Description of damage provided to responsible party for corrective action (D&D&D). Damage is scheduled for repair by April-May 2005.
8/24/04	Building TB-6 (north of tank farm and within the 150 ft control zone) demolished. Leaves a large opening in the asphalted area.	Footprint of building leaves a large area for surface water infiltration. Item reported to D&D&D management. Area is scheduled to be covered with asphalt in early FY-05.
8/24/04	Asphalt north of lined drainage ditch OA1 (south of tank farm) penetrated in two locations by soil probing equipment.	Penetrations from planned RI/FS soil investigation activities at contamination area CPP-15 RI/FS. Installed probehole casings (above ground) were removed and capped. Flushmount covers will be installed over the capped probehole casings and the damaged asphalt will be repaired. Work is scheduled to be completed in early FY-05.

Table 4-3. Summary of storm water collection system reported items.

Date	Item	Comments and Action Taken
10/27/03	Two hairline cracks observed on upper edge of lined ditch BS2 (see Figure 2-2).	The reported hairline cracks were photographed in October of 2003 (see Figure A-2 in Appendix A) and inspected monthly for any change. The cracks are located on the upper edged of the concrete-lined drainage ditch, BS2 (see Figure 2-2) where any captured water in the ditch would not flow. The condition of the hairline cracks did not change during the year. Due to the location of these cracks, they do not impact the ability of the system to manage the water and have not been identified for maintenance.
10/27/03	Weeds and cardboard observed in several section of the drainage system.	Laborer foreman contacted. Debris removed per notification.
11/13/04	Weeds and cardboard observed in several sections of the drainage system.	Laborer foreman contacted. Debris removed per notification.
4/27/04	A triangular corner section, measuring approximately 6-8 in. per side, broken off of an upper section of lined ditch BS1 (see Figure 2-2).	Broken section located just outside the northwest corner of the tank farm fence. Break is above where collected water would collect/flow. Recommended repair: none at this time. Break was inspected monthly and remained unchanged during the year.
7/19/04	Expansion joint material in ditch BS1 is partly loose on the eastern end.	Ditch BS1 was located inside a construction zone during the month of July. Expansion joint material was removed and disposed of in September of 2004. Replacement is scheduled for FY-05 (see Section 5).
7/19/04	Sediment identified in several lined ditches due to precipitation event.	Laborers cleaned lined ditches during the week of August 16.
8/24/04	Broken concrete on both sides of lined ditch CE1.	The upper part (both sides) of lined ditch, CE1 (see Figure 2-2), found broken due to movement of a tracked vehicle during D&D&D activities in July (see Figures A-1, A-3 in Appendix A). Description of damage provided to responsible party for corrective action (D&D&D). Damage is scheduled for repair by April-May 2005.

Table 4-4. Summary of storm water collection system reported radiological survey items.

Date	Item	Comments and Action Taken
10/20/03	Contamination detected in lined drainage ditches CA1 and CA2 (see Figure 2-2)	All contamination was determined to be rabbit fecal mater and was removed by the radiological technician.
11/13/03	Contamination detected outside tank farm in lined drainage ditch HS5 (see Figure 2-2)	Lined drainage ditch HS5 was roped off and identified as a radiological buffer area. The ditch was resurveyed in August 2004 and the previous elevated radiation levels were no longer detectable. As a result, the radiological buffer area designation was removed.

4.3 Lift Station

The lift station is located in the intersection of Olive Avenue and Beech Street and is identified on Figure 2-2 as CPP-1792. The station is a 10-ft-diameter by 15.8-ft-deep concrete sump covered with a pair of metal hatch doors. Major components include two 5-hp submersible sewage pumps, a forced main from the sump to the ditch discharge point, and the system controls. The system was inspected routinely as part of a Utilities Outside Equipment Checks and monthly as part of the TFIA routine inspections. Inspections entailed ensuring proper equipment operations, checking for high-water-level alarms, and visually inspecting system components. During the year only one maintenance item was reported. On January 28, 2004, it was noted on the inspection form that the lift station hatch doors had been damaged (broken weld and bend surface corners) due to excessive loads on the doors. The hatch doors were barricaded off, using traffic stanchions and rope, to prevent further damage by vehicle traffic.

To correct this deficiency, the following action is planned: Add metal bracing beneath the door frame and bolt to the concrete vault section. Repair will be designed and directed by a professional engineer.

This is scheduled to take place during FY-05 (see Section 5, An Estimate of Maintenance Activities Required for the Next Year). The traffic stanchions and rope will be maintained around the hatch doors, to prevent further damage, until the repair work is completed.

4.4 Evaporation Pond Liner and Perimeter

The evaporation pond and perimeter areas were inspected monthly for the following items during FY-04:

- Liner rips/tears/environmental degradation
- Animal intrusion
- Vegetation growth
- Liner anchoring integrity
- Perimeter fence integrity.

No deficiencies or maintenance items were reported. In addition no radiological surveys were performed since the immediate upstream lined drainage ditches had no detectable amounts of radiological contamination.

4.5 Evaporation Pond Leak Detection System

Monitoring data were collected during the inspection to evaluate the performance of the leak detection system. The following data were recorded:

- Hour meter reading (recorded the amount of time the sump pump operated)
- Water level reading (displays the level of water in leak detection sump during the inspection)
- Totalizer readings (cumulative gallons of water pumped from the leak detection sump and into the evaporation pond) both the day of the inspection and the following day.

The collected and calculated data are located in Table 4-5. During each monthly inspection process, the totalizer readings did not change from Day 1 to Day 2 resulting in a leak rate of 0 gal for the entire FY. The surface area of the water in the pond was estimated using an electronic range finder and was calculated during each inspection except during January and February when snow covered the frozen water in the pond.

4.6 Sediment Inspections and Removal

Monthly inspections were performed on the evaporation pond inlet (northwest corner), outlets (eastern edge), and bottom for sediment and debris accumulation. No notable amounts of sediment and debris were observed in the pond inlet and outlets (thus, no sediment sampling and analysis activities took place as required by the O&M Plan).

Table 4-5. The evaporation pond leak detection monitoring data.

Inspection Date	Hour Meter (hr)	Water Level (in)	Totalizer Day 1 (gal)	Totalizer Day 2 (gal)	Totalizer Difference (gal)	Estimated Surface Area of Water (ft^2)	Pond Bottom Covered[a] %	Leak Rate[b] (gal/ft^2)	Totalizer Difference from Previous Month (gal)	Totalizer Difference Since Oct 2003 (gal)	Difference in Surface Area from Previous Month (ft^2)
10/27/03	NA	NA	1,388.35	1,388.35	0	12,029	15	0	NA	0	NA
11/24/03	1.5	NA	1,427.15	1,427.15	0	18,772	24	0	38.8	38.8	+6,743
12/22/03	1.5	-1.4	1,443.5	1,443.5	0	23,490	30	0	16.4	55.2	+4,718
1/28/04	1.5	-1.2	1,443.5	1,443.5	0	Snow covered	NA	c	0	55.2	NA
2/24/04	1.5	10.8	1,443.5	1,443.5	0	Snow covered	NA	c	0	55.2	NA
3/23/04	2.6	12.9	2,161.5	2,161.5	0	44,469	57	0	718	773.2	NA
4/27/04	2.6	13.5	2,161.5	2,161.5	0	36,259	47	0	0	773.2	-8,210
5/25/04	2.6	13.6	2,161.5	2,161.5	0	31,630	41	0	0	773.2	-4,629
6/28/04	2.6	14.0	2,161.5	2,161.5	0	27,504	35	0	0	773.2	-4,126
7/19/04	2.6	14.1	2,161.5	2,161.5	0	51,480	66	0	0	773.2	+23,976
8/24/04	2.6	14.1	2,161.5	2,161.5	0	32,800	42	0	0	773.2	-18,680
9/22/04	2.6	14.0	2,161.5	2,161.5	0	32,213	41	0	0	773.2	-587

a. Bottom surface area of the evaporation pond is 77,760 ft^2.

b. Leak Rate = (totalizer reading day 2 – totalizer reading day 1)/surface area of water in pond.

c. Data not available for calculation.

NA = Data not obtained or insufficient data available to calculate.

5. AN ESTIMATE OF MAINTENANCE ACTIVITIES REQUIRED FOR THE NEXT YEAR

All simple maintenance items reported on the monthly inspection forms were addressed soon after they were identified (e.g., sediment and debris located in the lined drainage ditches was removed). The asphalt maintenance items, as reported in Section 4.1, Surface-Sealed Areas, were reported on during the August 2004 monthly inspection. The more complex items were either identified late in the year or required an engineering evaluation; thus, maintenance activities will be conducted during the next fiscal year. Table 5-1 describes identified maintenance items that are planned for maintenance activities during FY-05.

Table 5-1. Summary of maintenance activities for the next year.

Date Reported	Item Description	Planned Action	Estimated Cost	Estimated Completion Date
8/24/04	Building TB-6 (north of tank farm and within the 150 ft control zone) demolished. Leaves a large opening in the asphalted area.	Area has been excavated/graded as of October 2004. Area will be asphalted as part of a coordinated effort with INTEC facility maintenance activities.	$15K	Nov. 2004
	Asphalt north of lined drainage ditch OA1 (south of tank farm) penetrated in two locations by soil probing equipment.	Installed probehole casings (above ground) were removed and capped. Flushmount covers will be installed over the capped probehole casings and the damaged asphalt will be repaired.	$600	Nov. 2004
	(a) Asphalt near lined ditch CE1 (north of tank farm) damaged by track-mounted vehicle. (b) Broken concrete on both sides of lined ditch CE1.	Repair will be made under the INTEC Monitoring control account where all maintenance type activities are located.	$5-10K	May-June 2005
7/19/04	Expansion joint material in ditch BS1 is partly loose on the eastern end.	Replace material.	$200	May-June 2005
	Reseal.	Annual reseal of asphalt on tank farm.	$1,000	June-Aug. 2005
1/28/04	Lift station hatch doors have been damaged.	Install metal bracing beneath door frame and bolt to concrete vault.	$5-6K	May-June 2005

6. REFERENCES

10 CFR 835.401, 2004, "General requirements," *Code of Federal Regulations,* Office of the Federal Register, January 2004. (as promulgated as of October 1999)

10 CFR 835.1102, 2004, "Control of areas," *Code of Federal Regulations,* Office of the Federal Register, January 2004. (as promulgated as of October 1999)

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Appendix A

Photographs

Figure A-1. Track damage to asphalt near lined drainage ditch CE1.

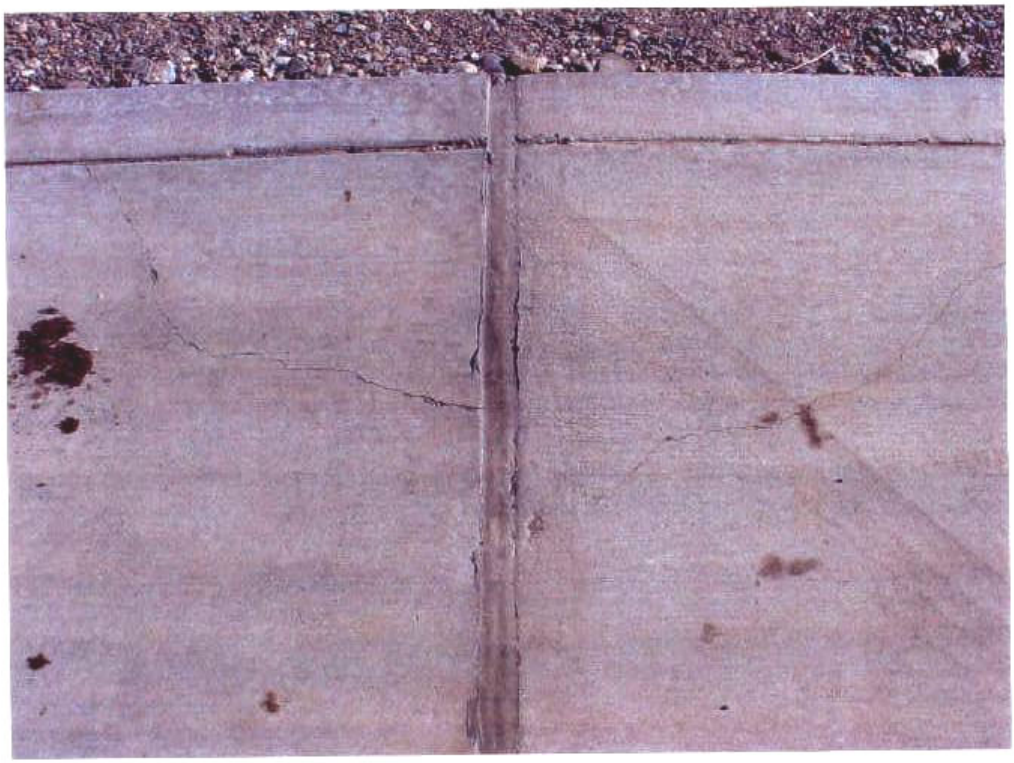

Figure A-2. Hairline cracks in lined drainage ditch BS2.

Figure A-3. Track damage to lined ditch CE1.